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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,895	04/16/2004	Hiroshi Shingai	890050.479	8973

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EXAMINER
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VERDERAME, ANNA L

ART UNIT	PAPER NUMBER
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1756

MAIL DATE	DELIVERY MODE
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06/04/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/825,895

Applicant(s)

SHINGAI ET AL.

Examiner

Anna L. Verderame

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 04/16/2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Claim Objections*

1. Claims 8-10 are objected to because of the following informalities: These claims recite T as being " $(n-1)/2$ " n is odd. This should be " $(n-1)/2$ ". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Shingai et al. 2002/0015816.

In sample 9, Shingai et al. teaches an optical recording medium as shown in figure 3 having a substrate, an  $\text{Ag}_{98}\text{Pd}_1\text{Cu}_1$  reflective layer, a second dielectric layer having a thickness of 20 nm, a  $\text{Sb}_{72.5}\text{Te}_{13.7}\text{In}_{0.9}\text{Ge}_{4.9}\text{Tb}_8$  recording layer having a thickness of 12 nm, a first dielectric layer of 80%ZnS-20%SiO<sub>2</sub> having a thickness of 68 nm, an AlN heat-dissipation layer having a thickness of 100 nm, and a UV curable protective layer (0071-0079). Sample 9 was spun at a linear velocity of 22.8 m/s and 27.6 m/s (see table 2). Shingai et al. also teaches the optical recording medium of sample 5 having a recording layer composition of  $\text{Sb}_{73.0}\text{Te}_{16.1}\text{In}_{1.1}\text{Ge}_{5.8}\text{Tb}_{4.0}$ . Sample number 5 was recorded using linear velocities of 11.4m/s, 16.3 m/s, and 22.8 m/s (see table 1).

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In regard to claims 6-7 Shingai et al. teaches that the first dielectric layer(disposed on the light incident side) has a thickness in the range of 30-300 nm, and that the second dielectric layer ( disposed on the side opposite the light incident side) preferably has a thickness in the range of 5 to 50 nm(0051). These ranges in Shingai overlap the ranges presented in claims 6 and 7.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingai et al. 2002/0015816.

In regard to claims 6-7 Shingai et al. teaches that the first dielectric layer(disposed on the light incident side) has a thickness in the range of 30-300 nm, and that the second dielectric layer ( disposed on the side opposite the light incident side) preferably has a thickness in the range of 5 to 50 nm(0051). These ranges in Shingai overlap the ranges presented in claims 6 and 7.

It would have been obvious to one of ordinary skill in the art to modify the optical recording medium of sample 9 taught by Shingai et al. by forming the first dielectric layer to have a thickness in the range from 30 to 40 nm and to form the second dielectric layer to have a thickness in the range of from 5 to 14 nm based

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on the disclosure at (0051) and with the reasonable expectation of forming a useful optical recording medium.

6. Claims 11-13 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingai et al. 2002/0015816 in view of Ando et al 6,519,413.

Shingai et al. 2002/0015816 does not teach an optical recording medium having ID data written therein.

Ando et al. teaches an optical recording medium as shown in figure 13 Having a lead-in area 1002. In the embossed data zone of the lead-in area 1002, the following pieces of information have been recorded before hand: information on recording reproducing and erasing characteristics including the recording power, recording pulse-width, erasing power, reproducing power, and linear velocity in recording or erasing (16/35-61). Media according to this invention include phase-change optical recording media (16/21-26). A trial recording area for checking the recording and erasing conditions is taught at (17/1-2). Apparatus is also taught at (17/5-6) and (2/11-13).

The optical recording medium taught by Ando et al. contains "data for identifying the optical recording medium written therein".

It would have been obvious to one of ordinary skill in the art to modify the optical recording medium of sample 9 taught by Shingai et al. by using the  $\text{Sb}_{73.0}\text{Te}_{16.1}\text{In}_{1.1}\text{Ge}_{5.8}\text{Tb}_{4.0}$  composition taught in sample 5 to form the phase-change recording layer and by adding an embossed data zone containing information including the linear velocity for recording and erasing as taught by Ando et al. with the expectation of forming an optical recording medium having ID

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data including information on optimal recording conditions written therein.

Further, it would have been obvious to have the specific linear velocity (ID data) found in the embossed data zone be 16.3 m/s, as taught in table 1 of Shingai et al, and to use an apparatus to read the embossed data found in the lead-in area as taught by Ando et al, with the reasonable expectation of success in recording/reproducing in/from the medium.

7. Claims 8-10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shingai et al. 2002/0015816 in view of Ando et al 6,519,413 and Ohno et al. 2002/0025443.

The combination of Shingai in view of Ando does not teach the specific pulse sequence or the recording, reproducing, and bottom power recited in claims 8-10 and 14-16.

Ohno et al teaches a phase-change optical recording medium at (0122). A (1,7)RLL-modulation pulse sequence( like that disclosed by the applicant) is used to record the medium (0125). A laser having a wavelength of 404 nm and a NA of 0.85 is also used. The bias (bottom) power, the recording power and the erasing power used were 0.1mW, 3.6 mW, and 1.5 mW respectively (0129). In this example the ratio of  $P_e/P_w$  is 0.41 which is in the range of 0.26 to 0.7 recited by the applicant.

It would have been obvious to one of ordinary skill in the art to modify the combination of Shingai in view of Ando by using a (1,7) RLL modulation and having the ratio of  $P_e/P_w$  be in the range from 0.26 to 0.7 based on the disclosure of Ohno et al, and to use an apparatus to read the embossed data found in the

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lead-in area as taught by Ando et al., with the reasonable expectation of success in recording/reproducing in/from the medium.

8. Claims 8-10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over. Shingai et al. 2002/0015816 in view of Ando et al 6,519,413 and Oishi et al WO 03/069605 (US 7,167,431 used as a translation).

The combination of Shingai in view of Ando does not teach the specific pulse sequence or the recording, reproducing, and bottom power recited in claims 8-10 and 14-16.

Oishi et al. teaches a dual-layer phase change optical recording medium. The medium is recorded using (1,7)RLL modulation to form 2T to 8T signals. The recording power, the erasing power, and the bottom power were set to 10.0 mW, 3.8mW, and 0.1 mW respectively. In this example the ratio  $P_e/P_w$  is 0.38 which is in the range of 0.26 to 0.7 recited in the claims. The wavelength of the laser beam used for recording was 405 nm and the numerical aperture of an objective lens used for converging the laser beam was 0.85[(US 18/10-19/40)/(WO27/15-30/1).

It would have been obvious to one of ordinary skill in the art to modify the combination of Shingai in view of Ando by using a (1,7) RLL modulation and having the ratio of  $P_e/P_w$  be in the range from 0.26 to 0.7 based on the disclosure of Oishi et al, and to use an apparatus to read the embossed data found in the lead-in area as taught by Ando et al., with the reasonable expectation of success in recording/reproducing in/from the medium.

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**Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-US2002/0012305- See example 1 (0074-0080) and table 1. Recording conditions taught at (0083-0093). Motivation for adding Ge (0063). The teachings of this reference are similar to those used in the rejections above and the examiner reserves the right to use this art in subsequent rejections.

-US2002/001284- See example 7 (0198-0203). Need for rapid cooling structure is shown. Effect of adding Tb found at (0204). The teachings of this reference are similar to those used in the rejections above and the examiner reserves the right to use this art in subsequent rejections.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna L. Verderame whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

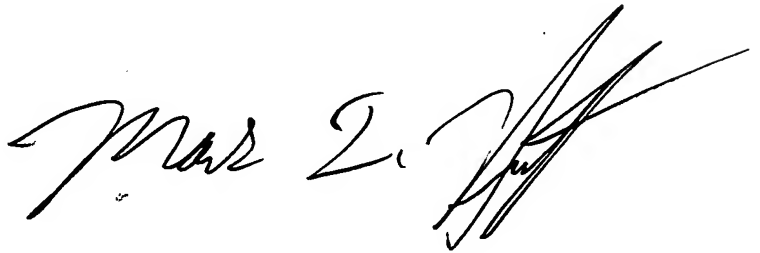


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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